

WHAT IS CLAIMED IS:

1. A discrimination apparatus that detects a counterfeit paper, said discrimination apparatus comprising:

5 an ultraviolet emission module that irradiates a paper as an object of discrimination with ultraviolet radiation;

a transmitted light measurement module that measures intensity of transmitted light of ultraviolet radiation, which is transmitted through the paper; and

10 a discrimination module that determines the paper as counterfeit or as genuine, based on the observed intensity of the transmitted light.

2. A discrimination apparatus in accordance with claim 1, said discrimination apparatus further comprising:

a fluorescence measurement module that measures intensity of fluorescence, which is excited from the paper by the ultraviolet radiation,

wherein said discrimination module determines the paper as counterfeit or as genuine, based on the observed intensity of the fluorescence as well as the observed intensity of the transmitted light.

3. A discrimination apparatus in accordance with claim 1, wherein said transmitted light measurement module measures the intensity of the transmitted light at multiple different positions on the paper, and

said discrimination module determines the paper as counterfeit or as genuine, based on measurement results at the multiple different positions.

4. A discrimination apparatus in accordance with claim 3,  
said discrimination apparatus further comprising:

5 a conveyor unit that conveys the paper relative to said  
ultraviolet emission module and said transmitted light  
measurement module,

wherein the multiple different positions include a site set in  
a conveying direction.

10 5. A discrimination apparatus in accordance with claim 1,  
wherein said ultraviolet emission module has multiple  
ultraviolet-emitting elements, which are located at multiple  
different positions to irradiate the paper with the ultraviolet  
radiation.

15 6. A discrimination apparatus in accordance with claim 1,  
wherein said transmitted light measurement module has multiple  
transmitted light-receiving elements, which are located at multiple  
different positions to measure the intensity of the transmitted light  
20 at the multiple different positions.

7. A discrimination apparatus in accordance with claim 6,  
said discrimination apparatus further comprising:

25 a pattern storage unit that stores in advance an allowable  
range of intensity of transmitted light measured at the multiple  
different positions to give a criterion of determination of a genuine  
paper,

wherein said discrimination module determines the paper as  
genuine, when at least a predetermined rate of the observed  
30 intensity of the transmitted light at the multiple different positions

is included in the allowable range.

8. A discrimination apparatus in accordance with claim 1,  
said discrimination apparatus further comprising:

5       a conveyor path, along which the paper is conveyed,  
      wherein said ultraviolet emission module is arranged to face  
said transmitted light measurement module across the conveyor  
path.

10       9. A discrimination apparatus in accordance with claim 2,  
said discrimination apparatus further comprising:

      a conveyor path, along which the paper is conveyed,  
      wherein said ultraviolet emission module is arranged to face  
said transmitted light measurement module and said fluorescence  
15   measurement module across the conveyor path.

10. A discrimination apparatus in accordance with claim 2,  
said discrimination apparatus further comprising:

      a conveyor path, along which the paper is conveyed,  
20       wherein said ultraviolet emission module and said  
fluorescence measurement module are arranged to face said  
transmitted light measurement module across the conveyor path.

11. A discrimination apparatus in accordance with claim 8,  
25   said discrimination apparatus further comprising:

      a visible radiation block filter that excludes visible radiation  
from the light emission of said ultraviolet emission module,  
      wherein said visible radiation block filter is located between  
said ultraviolet emission module and the conveyor path.

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12. A discrimination apparatus in accordance with claim 9, said discrimination apparatus further comprising:

a visible radiation block filter that is located between said transmitted light measurement module and the conveyor path to  
5 exclude visible radiation; and

an ultraviolet radiation block filter that is located between said fluorescence measurement module and the conveyor path to exclude ultraviolet radiation.

10 13. A discrimination apparatus in accordance with claim 9, said discrimination apparatus further comprising:

a light reflector that reflects ultraviolet radiation, while allowing transmission of a residual light component,

wherein said light reflector is located between said  
15 fluorescence measurement module and the conveyor path to lead reflected light from said light reflector to said transmitted light measurement module.

14. A discrimination apparatus in accordance with claim 1,  
20 said discrimination apparatus further comprising:

a conveyor path, along which the paper is conveyed; and  
protective glasses that are respectively located between said ultraviolet emission module and the conveyor path and between  
said transmitted light measurement module and the conveyor path,  
25 said protective glasses being composed of a material that allows transmission of ultraviolet radiation but prohibits excitation of fluorescence by the ultraviolet radiation.

15. A discrimination apparatus in accordance with claim 1,  
30 said discrimination apparatus further comprising:

a conveyor path, along which the paper is conveyed;  
a visible radiation block filter that excludes visible radiation  
from the light emission of said ultraviolet emission module; and  
a protective glass composed of a material that allows  
5 transmission of ultraviolet radiation but prohibits excitation of  
fluorescence by the ultraviolet radiation,

wherein said ultraviolet emission module, said visible  
radiation block filter, and said protective glass are arranged in this  
sequence relative to the conveyor path, and

10 a reflection surface covered with a reflective coat for  
reflecting ultraviolet radiation is formed between said visible  
radiation block filter and said protective glass.

16. A discrimination method that detects a counterfeit paper,  
15 said discrimination method comprising:

an ultraviolet emission step of irradiating a paper as an  
object of discrimination with ultraviolet radiation;

a transmitted light measurement step of measuring  
intensity of transmitted light of ultraviolet radiation, which is  
20 transmitted through the paper; and

a discrimination step of determining the paper as counterfeit  
or as genuine, based on the observed intensity of the transmitted  
light.

25 17. A discrimination method in accordance with claim 16,  
said discrimination method further comprising:

a fluorescence measurement step of measuring intensity of  
fluorescence, which is excited from the paper by the ultraviolet  
radiation,

30 wherein said discrimination step determines the paper as

counterfeit or as genuine, based on the observed intensity of the fluorescence as well as the observed intensity of the transmitted light.